10.

FOREIGN BODIES IN THE AIR-PASSAGES.

A STUDY OF

ONE THOUSAND CASES TO DETERMINE THE PROPRI-ETY OF BRONCHOTOMY IN SUCH CASES.

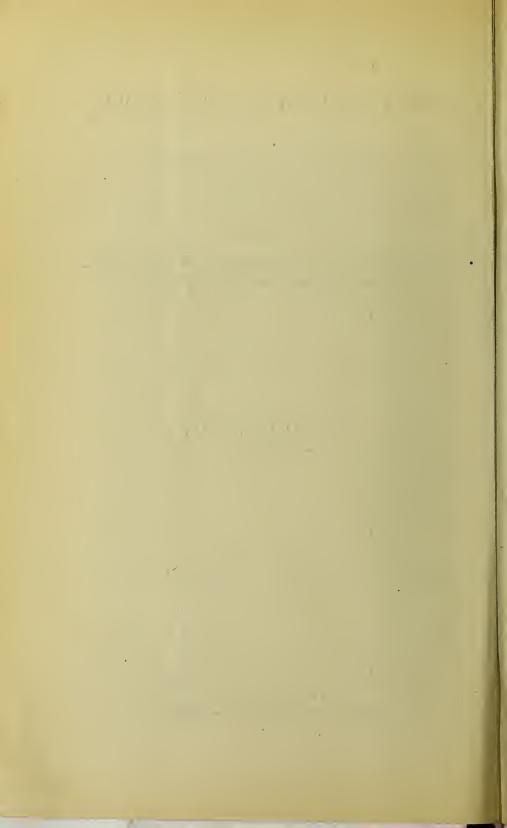
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J. R. WEIST, M.D.,

RICHMOND, IND.

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FOREIGN BODIES IN THE AIR-PASSAGES.*

One of the evidences of the advancement of surgical science is that its *dicta* no longer emanate from an individual, but are formulated from the united experience of the profession. Every one, therefore, who adds a new fact or assists in classifying those furnished by others aids in their construction and becomes in part responsible for them. This divided responsibility, as well as the respectful hearing which labor alone secures for even the most obscure student, give me the courage to appear before you and question whether one of the accepted rules in surgical practice is correct.

Although Frédéric Monavius in 1644 formally advised tracheotomy for the removal of foreign bodies in the air-passages,† and Verduc and Heister called attention in 1739 to new facts and advised the operation,‡ and Louis in his celebrated memoir in 1759,‡ after presenting the facts previously published, declared himself strongly in favor of bronchotomy in such cases, it was not until a much later period that there was a general agreement among surgeons as to the propriety of the operation in cases of this accident. Indeed it was only since the elaborate discussion on Foreign Bodies in the Air-passages by Prof. Gross in 1854 that this was effected.

In the work referred to Prof. Gross says there has been established "the important practical precept to resort to bronchotomy

^{*} Read before the American Surgical Association, in Philadelphia, June 1, 1882. All the tables mentioned are here omitted except Table No. 6, which is a summary of the others. All the tables will appear in full in the Transactions of the Association.

[†]F. Guyon, Dictionnaire Encyclopedique des Sciences Medicales, art. Larynx, p. 725. ‡16. p. 698.

in all cases the moment it is known that there is a foreign substance in the windpipe."*

That this statement is a clear enunciation of an established rule in surgery, may be made evident by a brief examination of some of the leading authorities on the subject.

Prof. Gross, in the work already quoted, in his general summary says, inasmuch as no confidence can be placed in other means, "It follows as a necessary corollary that bronchotomy affords the best chance of relief, and that consequently it should always be resorted to as early as possible, unless there is some special contra-indication."† In the last edition of his Surgery this opinion is reaffirmed in these words: "Having satisfied himself that the foreign body is in the air-passages, the sooner the windpipe is opened the better."‡

Mr. Erichsen says, "If a patient be seen a few hours, days, or weeks after a foreign body has been introduced into the airpassages, or indeed at any period after the accident, and inversion have failed, tracheotomy ought to be performed; and this should be done even though the symptoms be not urgent."

Mr. A. E. Durham says, "When a foreign body is known to be retained in some part or other of the air-passages, the promptest treatment is demanded. The surgeon should not trust to the unaided efforts of nature to expel the extraneous substance. As a general rule, the windpipe should be opened with as little delay as possible in every case in which a foreign body is certainly known to be retained in any part of the air-passages."

Mr. T. Holmes says, "When the diagnosis of a foreign body has been made, the surgeon should allow no delay in removing it at once." ¶

Says Mr. Bryant, "Given the diagnosis of a foreign body in the windpipe, the duty of the surgeon plainly is to endeavor to remove it. There should be no deviation from this rule. The

^{*}A Practical Treatise on Foreign Bodies in the Air-passages, p. 229. † 176. p. 458. ‡ Prin. and Prac. of Surgery (ed. 1878), vol. 2, p. 409. § Science and Art of Surgery (Amer. ed. 1869), p. 388. || Holmes's System of Surgery (Amer. ed.), vol. 1, p. 710. ¶ Treatise on Surg., its Prin. and Prac., p. 211.

surgeon should never allow himself to be misled by the mildness of the symptoms, nor by the knowledge that in rare instances foreign bodies have remained in the passage for years and even then expelled, as such cases are exceptional. The accident is one that will inevitably destroy life, although it must be doubtful at what time or in what form danger may appear."*

Opinions similar to the above might be easily multiplied, but to add to them would be a needless repetition, as they are sufficient to establish the proposition that it is at present a doctrine in surgery that, as a general rule, the certainty of the presence of a foreign body in the air-passages makes bronchotomy necessary.

Prof. Gross observes that "no man, however old or however great his opportunities for observation, can possibly have much experience in this branch of surgery.† It therefore follows as a necessary consequence that the rule given rests chiefly on the collective experience that has from time to time been assembled in statistical tables, the most complete and authoritative of which are those of Prof. Gross and Mr. Durham. These tables certainly seem to afford a sufficient basis on which to rest the conclusion that in cases of foreign bodies in the air-passages bronchotomy offers a far better chance of recovery than waiting for spontaneous expulsion. A brief examination of the tables in question will make this apparent. Prof. Gross's tables ! contain the particulars of eighty-five cases of the accident not subjected to bronchotomy. Of these, fifty-six, or 65.76 per cent, recovered (including three cases of expulsion by use of emetics and four by inversion of the body), and twenty-nine, or 34.11 per cent, died (including eight cases of death after spontaneous expulsion).

Bronchotomy was practiced in ninety-eight cases, eightythree, or 84.69 per cent, recovered, and fifteen, or 15.30 per cent, died.

Mr. Durham reports § two hundred and seventy-one cases

^{*} Practice of Surg., p. 562.

[†] Foreign Bodies in Air-passages, p. viii.

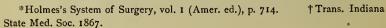
[‡] Foreign Bodies in the Air-passages.

[&]amp; Holmes's System of Surgery, vol. I (Amer. ed.), pp. 709-10.

without operation; one hundred and fifty-six recovered, or 57.5 per cent; one hundred and fifteen died, or 42.5 per cent. Cases operated on, two hundred and eighty-three; recovered, two hundred and thirteen, or 75.2 per cent; seventy died, or 24.8 per cent. Among the cases of Mr. Durham reported as recovering after operation, are three cases of direct extraction, and twelve by inversion of the body and succession. These should be excluded in estimating the chances of recovery with and without the operation. Doing this there remain two hundred and sixty-eight cases subjected to bronchotomy; one hundred and ninety-eight recovered, 73.88 per cent, and seventy died, or 26.11 per cent.

Mr. Durham, in another table,* reports one hundred and sixty-seven cases of tracheotomy for foreign bodies in the airpassages. Of these, one hundred and thirty recovered, or 77.85 per cent; thirty-seven died, or 22.15 per cent. Adding the cases of Prof. Gross to those of Mr. Durham, the result is a total of seven hundred and twenty-two cases; three hundred and fifty-six without operation, and two hundred and twelve recoveries, or 59.55 per cent—one hundred and forty-four deaths, or 40.49 per cent. With operation three hundred and sixty-six, two hundred and eighty-one recovered, or 76.77 per cent, and eighty-five died, or 23.22 per cent—a difference of 17.22 per cent in favor of operation.

In 1867 I collected and published† the particulars in relation to one hundred and sixty-three cases of foreign bodies in airpassages. The results of these cases were so greatly at variance with reports of a similar kind previously published that I was led on the advice of Prof. Gross to continue the collection of cases. Accordingly, in 1879 I issued a circular to the profession asking for a report of cases. This circular was extensively distributed throughout the United States and Europe, and met with a liberal response; and the cases reported, together with a small number collected from medical journals, make an aggregate of one thousand. The particulars in relation to these cases may be found in the accompanying tables. The chief value of the





tables, perhaps, arises from the fact that it is only possible for a small number of the cases to have ever been used in a statistical inquiry, as eight hundred and ninety-seven are reported as never having been published.* A large amount, therefore, of new material is presented for use in determining the validity of the surgical rule previously given in cases of foreign bodies in the air-passages.

As table No. 6, which is a summary of those preceding it, contains in a compact form all the facts important for statistical purposes, it would be a needless repetition to reproduce other than the leading ones here. In sixty-three cases the foreign body was removed by operative measures other than bronchotomy—e. g. with forceps, with or without the aid of the laryngoscope, etc. These are excluded in calculating the chances of recovery afforded by bronchotomy, compared with those following the plan of non-interference. There remain nine hundred and thirty-seven cases; of these, five hundred and ninety-nine were not subjected to bronchotomy; four hundred and sixty recovered, or 76.79 per cent; one hundred and thirty-nine died, or 23.20 per cent.

Bronchotomy was performed in three hundred and thirty-eight cases, with two hundred and forty-five recoveries, or 72.48 per cent; ninety-three patients died, or 27.42 per cent—a difference in favor of non-interference of 4.31 per cent. In cases without operation these tables show 11.03 per cent more recoveries than do those of Prof. Gross, and 19.29 per cent than those of Mr. Durham, and 7.24 per cent than the aggregate of the cases of Prof. Gross and Mr. Durham. In the cases in which bronchotomy was performed, the tables show 12.21 per cent less recoveries than those of Prof. Gross, 1.40 per cent less than those of Mr. Durham, and 4.29 per cent less than the united cases of these gentlemen. Combining the cases here reported with those of Prof. Gross and Mr. Durham, the result is a total of nine hundred and fifty-five cases without operation, of which two hundred

*The cases collected from original sources and reported to me as unpublished, contained in my report to the Indiana State Med. Soc. in 1867, I here report as unpublished, as this is but a continuation of that work.

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and eighty-three, or 29.78 per cent, died. The sources named furnish a total of seven hundred and nineteen bronchotomies. with one hundred and seventy-eight deaths, or 24.75 per cent. As a result of this study of one thousand six hundred and seventy-four cases, it appears that without operation there is one death in 3.5 cases, and one in four after bronchotomy.

The cases of laryngotomy, reported by Prof. Gross, give 76.52 per cent of recoveries, and 23.50 per cent of deaths; cases of laryngo-tracheotomy, 76.92 per cent of recoveries and 23.8 per cent of deaths; and the cases of tracheotomy, 88.23 per cent of recoveries and 11.76 per cent of deaths.

Mr. Durham reports 76.52 per cent of recoveries after laryngotomy, and 23.50 per cent of deaths; 75 per cent of recoveries after laryngo-tracheotomy, and 25 per cent of deaths; and 73.59 per cent of recoveries after tracheotomy, and 26.40 per cent of deaths. In the tables appended, thirty-six cases of laryngotomy give thirty recoveries, or 83.33 per cent, and six deaths, or 16.66 per cent; twenty-six cases of laryngo-tracheotomy give nineteen recoveries, or 73.07 per cent, and seven deaths, or 26.93 per cent; and two hundred and seventy-six cases of tracheotomy give one hundred and ninety-six recoveries, or 71.02 per cent, and eighty deaths, or 28.98 per cent. The tables of Prof. Gross, Mr. Durham, and my own give seventy cases of laryngotomy, with fifty-six recoveries, or 80 per cent, and fourteen deaths, or 20 per cent; fifty-nine cases of laryngo-tracheotomy, with fortyfour recoveries, or 74.57 per cent, and fifteen deaths, or 25.42 per cent; and six hundred and five cases of tracheotomy, with four hundred and forty-nine recoveries, or 74.21 per cent, and one hundred and fifty-six deaths, or 25.78 per cent.

It appears from this calculation that after laryngotomy for foreign bodies in the air-passages, one patient in five dies; and after laryngo-tracheotomy and tracheotomy, one in four dies.

Although this study of the combined tables yields results slightly different from those furnished by my own—being a little more favorable for bronchotomy—the difference is too slight to furnish an argument in support of the existing surgical rule.

This becomes apparent when the cases here presented are examined alone.

If table No. 6 is examined, the fact will be disclosed that a study of the new material presented does not tend to establish the correctness of the opinion that the presence simply of a foreign body in the air-passages determines the necessity of bronchotomy.

The foreign body that most frequently finds a lodgment in the air-passages is a grain of corn (maize), one hundred and seventy-seven examples are here presented. In these cases spontaneous expulsion followed by recovery occurred in sixty-six, or 71.74 per cent. There was a fatal result in twenty-six, or 28.26 per cent, cases without operation. Bronchotomy was practiced in eighty-five; sixty-six recovered, or 77.64 per cent and nineteen died, or 22.36 per cent.

In one hundred and nine cases a watermelon-seed (Cucumis citrullus) was the extraneous substance. Of the seventy-five cases without operation, seventy, or 93.33 per cent, recovered, and five, or 6.66 per cent died; and of the thirty-four cases in which bronchotomy was practiced, twenty-six, or 76.47 per cent recovered, and eight, or 23.53 per cent, died—a death-rate 16.87 per cent greater than in the cases without operation.

In ninety cases the foreign substance was a bean. Of fifty-one cases without operation, thirty, or 58.82 per cent, recovered, and twenty-one, or 41.17 per cent, died. Bronchotomy was performed in thirty-nine cases; twenty-four, or 61.54 per cent, recovered, and fifteen, or 38.46 per cent, died—a mortality 2.71 per cent more favorable than in the cases without operation.

In fifty-nine cases a grain of coffee was lodged in the air-passages. Of the thirty-four cases without operation, twenty-nine, or 85.29 per cent, recovered, and five, or 14.71 per cent, died. Of the twenty-five cases operated on, fourteen, or 56 per cent, recovered, and eleven, or 44 per cent, died—a death-rate 29.29 per cent greater than in the cases without bronchotomy.

Under the head of "seeds of various kinds" are found ninetyfour cases; fifty-eight without operation, and forty-seven, or 81.03 per cent, recoveries, and eleven, or 18.96 per cent, deaths. In thirty-six cases operated on, there were twenty-seven, or 75 per cent, recoveries, and nine, or 25 per cent, deaths, or 7.04 per cent more than in the cases without operation.

In three hundred and seventy-one cases in which the foreign body comes under the head "miscellaneous," two hundred and sixty-three cases were without operation; of these, one hundred and ninety-nine, or 75.67 per cent, recovered, and sixty-four, or 24.33 per cent, died. In one hundred and eight cases of bronchotomy, there were seventy seven, or 71.29 per cent, recoveries, and thirty-one, or 28.71 per cent, deaths—a number 4.38 per cent greater than in the cases without operation.

In presenting these facts, I am not seeking to bring bronchotomy into discredit in cases of foreign bodies in the air-passages. In a large number of cases the larynx or the trachea must be opened to save life, and the surgeon who fails to urge the necessity of prompt operation will be neglectful of his duty. I am only striving to show that the present accepted rule is too broad; that in many cases when it is certainly known that the trachea or bronchia contains a foreign body, the patient will be more likely to recover if trusted to the chance of spontaneous expulsion, than he will if subjected to operation. If this teaching be accepted, it will be important to determine in what cases bronchotomy should be performed and in what cases avoided. The cases presented will offer some assistance in the solution of the question. When the nature of the foreign body is known, the propriety of an operation can be more easily determined than when it is not, as it is apparently settled that certain substances are much more likely to be expelled spontaneously than others.

Among the great variety of substances that sometimes find a lodgment in the air-passages, watermelon-seeds, after grains of corn, are the most frequent; yet the tables show that in the cases in which a watermelon-seed was the foreign substance, there was spontaneous expulsion and recovery in 93.33 per cent, or 16.86 per cent more than in the cases subjected to bronchotomy. When the accident was the result of the introduction of a grain

of coffee, the cases trusted to the efforts of nature gave 29.29 per cent more recoveries than in the cases in which bronchotomy was performed.

And in the cases in which seeds of different kinds and miscellaneous substances found a lodgment in the air-passages, a percentage is found in favor of non-interference. The deduction from these facts is, that when the foreign body is one of the kind mentioned, nature will effect more cures than the surgeon. This is the general deduction, but cases will frequently occur in which an operation is imperatively demanded, whatever the foreign substance may be. The conditions demanding a variation from the general rule will be noticed presently.

When the foreign body is impacted in one of the bronchia, the chances of expulsion at the time of operation are small, and attempts at extraction by instruments generally end in failure. Ninety-three deaths are reported after bronchotomy in these tables. In seventy-three cases, or 78.38 per cent, the foreign body was not removed. It is probable that in a large number of these cases the foreign body was impacted in one of the bronchia. It is evident, therefore, that an operation undertaken in such a condition offers but little chance of success. No argument is needed to prove that when a foreign body is so impacted in the trachea or one of the bronchia as to make its removal impossible, the addition of a serious wound of the larynx or trachea must add to the patient's danger; yet one source of increased danger may be mentioned.

In cases where the foreign body is not removed after tracheotomy, death from pneumonia is more likely to occur than in
cases without operation. In the cases of death after operation
and without the removal of the foreign body, pneumonia is put
down as the cause in 30.13 per cent, while the same disease
caused death in only 18.70 per cent of the fatal cases without
operation and without the removal of the foreign body—a difference of 11.43 per cent. It is a legitimate inference in cases
of impaction of the kind described, that the chances of life are
diminished by bronchotomy. It is admitted that in many cases

of impaction the wound in the windpipe has been kept open and the foreign body expelled after a considerable period of time, but there is an equal number of cases in which no operation was performed, and the same fortunate result occurred. In five cases reported in the tables, tracheotomy was performed, and several months after the closure of the wound the foreign body was spontaneously expelled. In these cases the danger of a serious operation was added to that which arose from the presence of the foreign body. These patients survived, but how many of the seventy-three patients reported as dying after operation, and without expulsion of the foreign body succumbed because of the operation, is a question that never will be answered. a number of cases an operation was strongly advised, but declined, and recovery followed spontaneous expulsion. In two cases an operation was actually commenced, but abandoned because of hemorrhage, yet the patient recovered.

In many cases the foreign body—after the first paroxysm of strangulation has passed—causes but little if any trouble, even when it remains for a long period. While we can not be certain that these patients are ever free from danger while the foreign body is retained, it can be said, basing the assertion upon the results here presented, that non-interference affords a better chance of recovery than bronchotomy.

When non-interference is spoken of, I refer to the operation of bronchotomy. In some cases the foreign body may be removed by other means; forceps may be used. The laryngoscope in certain instances will enable the surgeon to use this instrument with precision and success. In every case that offers a reasonable prospect of success, an effort at direct extraction should be made. The ninety-three cases here reported in which the foreign body was thus removed are evidence that success may sometimes be expected.

Although cases are reported in these tables in which expulsion of a foreign body was effected during the acts of sneezing or vomiting, my investigations do not lead me to hold errhines and emetics in higher esteem than do most surgeons of the pres-

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ent day. Indeed, it is my conviction that they should never be employed. In regard to inversion of the body and succussion, I hold the same opinion expressed in relation to the use of emetics. Although success sometimes attends their employment, as shown by the twenty-six cases here reported, the danger of causing immediate death is so great as to overshadow the occasional success reported. I am therefore fully in accord with the surgeons who teach that these means should never be employed, unless the surgeon is ready to open the windpipe at once should an emergency occur. It would be a still better teaching, I believe, to say that these methods should never be resorted to until after an opening into the windpipe has been made.

These observations, in relation to other means than bronchotomy for the removal of foreign bodies from the air-passages, are hardly relevant to the subject under consideration. Their importance, however, permits their introduction here.

Having attempted to show why bronchotomy should not be resorted to in many cases where an extraneous substance has been introduced into the air-passages, it remains to notice the cases in which a resort should be had to the knife. It very rarely happens that a surgeon sees a case of this accident during the paroxysm of strangulation that immediately follows the introduction of a foreign body into the air-passages. The question of operation is usually presented at a later period.

Whenever the symptoms continue urgent, or attacks of threatening suffocation come on frequently, bronchotomy should be resorted to without unnecessary delay, provided that direct extraction is not practicable. When threatening symptoms are continuous, it will generally be found that the foreign body is lodged in the larynx, and causing signs of rapid strangulation by reflex action, or a constantly-increasing embarrassment of respiration by stenosis depending on edema, or active inflammation. In such cases the sooner an operation is performed the better. Of the two conditions mentioned as causing constant serious symptoms, the second is the most dangerous, although

there may be no paroxysms of strangulation after the first. In such cases there can hardly be a hope of spontaneous expulsion. I have lately seen a child die in this way. While the child was at play with a piece of dried apple in its mouth, a sudden fit of strangulation came on that lasted only for a short time. An hour afterward, when I saw the child, there was no distress. and no symptoms indicating a serious accident beyond a slight embarrassment of respiration and huskiness of the voice. I advised that no operation be performed before the advent of other symptoms. No more paroxysms of strangulation appeared, but the difficulty of respiration slowly increased for two days. Then bronchotomy was proposed, but declined. The symptoms steadily grew worse, and the patient slowly died from asphyxia at the end of the fourth day after the accident. On examination after death, a small, thin piece of the coriaceous seed-envelop of an apple was found in the right ventricle of the larynx. cous membrane of the larynx and the tissues beneath were highly edematous. While it is hardly possible that this foreign body could have been directly removed by an operation its discovery even at the autopsy being difficult, owing to its color, small size, and position—life might have been prolonged by an opening below the seat of obstruction, and a chance been thus gained of spontaneous expulsion at a later period.

A similar condition of the larynx may be present even when the foreign body is lodged in the trachea or bronchia. I saw an excellent example of this kind while writing these pages. A boy four years old, while playing with grains of corn (maize) in his mouth, suddenly strangled. The urgent symptoms lasted for some time. After they had subsided, the child was brought a distance of several miles to me. When I saw him, the respiration was not greatly embarrassed. The grain of corn was evidently lodged in the right bronchus. I advised delay, and heard no more of the case for three days. Then I was sent for, and found the conditions greatly changed. The foreign body still remained in the bronchus, interfering much with the passage of air into the right lung. All the signs of slow asphyxia were

of strangulation had occurred since the first. I made the operation of laryngo-tracheotomy without further delay. The grain of corn was not dislodged from its position. An instrument was passed through the wound into the mouth, on the supposition that a second grain of corn might be in the larynx. None was found. After the operation the respiration was free and easy. The wound was kept open, and twenty-four hours after the operation the foreign body escaped through the wound. Several days elapsed before the obstruction in the larynx passed away. The cause of this stenosis I do not know. It may have been the introduction of the father's finger into the throat to provoke vomiting at the time of the accident. However produced, it was this condition that made the operation absolutely necessary, and not the grain of corn impacted in the bronchus.

When the foreign body is loose in the trachea, its movements cause frequent attacks of strangulation. In such a case bronchotomy is demanded, not only to afford present relief, but to obviate the great danger of sudden death from a lodgment of the extraneous body in the rima glottidis.

I am aware that statistical evidence is not always reliable; that in surgical practice it can do no more than indicate in any given case what is probably the correct course of action. But as the surgical rule here examined has been established on this kind of evidence, it is surely admissable to ask for a reconsideration of the matter, in order that new testimony of the same character may be introduced and have its proper influence in determining if the old decision shall be reaffirmed or reversed.

The Fellows of this Association will place, I am sure, a correct value on the new material here presented, and if they are convinced that in these investigations I have sought only the truth, I shall be rewarded for the no small amount of labor expended in collecting and arranging the cases reported in these tables—cases that in my opinion justify the following conclusions, viz:

I. When a foreign body is lodged either in the larynx, trachea, or bronchia, the use of emetics, errhines, or similar means



should not be employed, as they increase the sufferings of the patient and do not increase his chances of recovery.

- 2. Inversion of the body and succussion are dangerous, and should not be practiced unless the windpipe has been previously opened.
- 3. The presence simply of a foreign body in the larynx, trachea, or bronchia does not make bronchotomy necessary.
- 4. While a foreign body causes no dangerous symptoms, bronchotomy should not be performed.
- 5. While a foreign body remains fixed in the trachea or bronchia, as a general rule bronchotomy should not be practiced.
- 6. When symptoms of suffocation are present or occur at frequent intervals, bronchotomy should be resorted to without delay.
- 7. When the foreign body is lodged in the larynx, there being no paroxysms of strangulation, but an increasing difficulty of respiration from edema or inflammation, bronchotomy is demanded.
- 8. When the foreign body is movable in the trachea, and excites frequent attacks of strangulation, bronchotomy should be performed.

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FOREIGN BODIES IN THE AIR-PASSAGES. Table No. 6. Summary of Tables Nos. 1, 2, 3, 4, and 5.

	No.	AND.	SEX.	RE	COVE	RIES &	: D'тн	s. A	AGES OF PATIENTS RECOVERED.					Ac	Ages of Patients.—Deaths.						Period of Expulsion.								How Expelled					Cause of Death.					Pub	OR				
CASES.—WITHOUT OPERATION.		Male.	Female.	eries.	Deaths.	of Recov- eries.	Deaths.	Per Cent	Years. Under	Years.	Years.	Years.	Years.	Over 10 Years.	ı Year.	Years.	years.	3 to 4 Years.	4 to 5 Years.	5 to 10 Years.	Over 10	Under Day	Days. I to 2	Days.	Days.	5 to 6 Days.	6 to 7 Days.	u to 2 Weeks.	2 to 3 Weeks.	Weeks.	Over 1	Coughing.	Sneezing.	By Fall.	Inverted.	Not Stated.	Asphyxia.	Pneumonia.	Bron-Pneu.	Abscess.	Exhaustion Larvagitie	Cons'mpt'n.	Published.	Not Published.
Total No. of Cases	92 75 51 34 58	375 5 39 1 29 1 20 1 20 1 20 1 182	32 36 22 14 7 31 8	460 66 70 30 29 47 199	139 5 26 20 21 7 11 7 64	76.7 71.7 93.3 58.8 85.2 81.0 73.0	9 23. 4 28. 3 6. 2 41. 9 14. 9 18. 8 26. 7 24.	20 10 26 3 66 3 17 6 71 3 96 3 92 6 33 3	52 22 22 77 11 88 50 20 33	2 45 9 9 11 3 5 5 5 0 12	45 6 13 5 6 7 1	34 9 4 4 1 2 0 14	124 19 21 15 6 13 4	150 12 12 2 2 11 14 97	7 3 0 0 0 1 0 3	30 5 3 6 1 2 0 13	24 7 0 8 1 4 0 4	15 2 1 3 1 1 0 7	12 5 0 1 0 0 0 6	23 4 1 2 1 1 2 12	28 0 0 1 1 2 5 19	63 6 6 5 3 6 0 37 1	26 2 6 2 2 1 1 0 14	3 18 2 3 4 2 1 1 2 2 3 4 1 3 8 5	3 12 2 2 1 0 0 1 6	11 1 2 2 0 2 1 3	12 0 1 1 2 1 0 7	60 13 11 7 7 7 5 3 14	27 5 5 3 1 2 3 8	24 8 3 I 2 3 O 7	184 20 32 6 9 20 7 90	412 2 59 62 29 24 40 19	6 5 7 0 4 2 1 0 3 1 1 0 0 0	5 0 2 0 0 3 0 0	6 0 0 0 0 2 0 4	6 0 0 0 1 1 0 4	84 15 4 17 2 6 2 38	26 5 1 3 2 3 9	7 5 0 0 0 0 0 0 2	10 0 0 0 0 1 1 8	5 4 0 1 0 0 0 1 0 0 1 1 0 0 0 4 1	3 0 0 0 0 0	27 2 0 2 1 3 1 18	572 90 75 49 33 55 25 245

	No. A	No. AND SEX. RECOVERIES & D'THS. AGES OF PATIENTS RECOVERED. AGES OF PATIENTS.—DEATHS.													s.	LARYNGOTOMY.						LARYNGO- TRACHEOTOMY.					Ткаснеотому.				. CA	AUSE O		Voice Or Im	Pub. Or Not.			
CASES. WITH OPERATION.	Total No.	Femalc. Male.	Recov- eries.	Per Cent of Recov- eries.	Per Cent of Deaths.	Under 1 Year.	years.	Years. 3 to 4 Years.	5 to 10 Years.	Years. Over 10	Years. Under I Year.	years.	3 to 4 Years.	4 to 5 Years.	years. 5 to 10 Years.	Over 10	Total.	Rec'v'red	Rec'v'ries	Deaths.	Per Cent	Rec'v'red	Died.	Per Cent of Rec'v'ries	Per Cent of Deaths.	Total.	Died.	Rec'v'ries	Per Cent of Deaths.	Removed.	Not Removed.	Asphyxia.	Hemor- rhage.	Pneu- monia. Exhaus-	Other Causes.	Lost.	Impaired.	Not Published Published
Total No. of Cases Grains of Corn	85 34 39 25 36	53 3 ³ 20 12 17 22 13 12 26 9	27	3 72.48 9 77.62 8 76.47 61.52 1 56.00 9 75.00 1 71.20	22.36 7 23.53 4 38.46 0 44.00 0 25.00	6 0 0 5 1	40 35 13 10 8 6 3 5 5 0 0 5 0 1 11 8	22 I 8 2 5 I 2 0 4	6 68 8 13 5 6 0 2 3 12 0 1 4 29	43 8 2 4 1 3 9	12 31 2 7 5 3 0 7 0 1 0 4 0 0 5 9	15 3 0 3 3 0 0 6	8 I O 2 4 O O I	9 3 0 1 3 1 0 1	14 3 0 2 0 4 0 5	4 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	36 3 6 9 2 2 2 3 12 1	0 6 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 83.3 0 10 1 88.8 2 0 10 0 10 1 91.6	0 10	0 .	4 3 1 2 2 2 1 1 0 0 0	7 i i o i i o o 3	73.07 75 50 100 50 0	26.93 25 50 0 50 100	276 75 23 35 21 33 8 81	196 80 57 18 17 6 22 13 13 8 25 8 8 0 54 27	71.02 76 73 91 62.85 61.91 75.75 100 66.66	28.98 24.26.09 37.15 38.09 24.25 0 33.34	20 6 0 5 1	73 13 8 15 6 8 0	19 1 3 4 2 4 0 5	8 I 3 I 2 O 0 O 2	5 32 4 8 0 4 3 1 1 4 2 2 0 0 5 13	19 3 0 5 4 1	5 1 0 0	r9 2 3 1 0 0 1 12	71 267 11 74 7 27 6 33 2 23 11 25 0 11 34 74

	No.	AND	Sex.	RECOV DEA	How Soon Removed.										How REMOVED.						WHERE LOCATED.			uв. Not.		
REMOVED BY OPERATION OTHER THAN BRONCHOTOMY.	Total No.	Male.	Female.	Recovered.	Died.	Under 1 Day.	I to 2 Days.	2 to 3 Days.	3 to 4 Days.	4 to 5 Days.	5 to 6 Days.	6 to 7 Days.	I to 2 Weeks.	2 to 3 Weeks.	Weeks.	Over 1 Month.	Forceps and LarMirror.	Forceps.	Probang.	Wire Hook.	Finger.	Larynx.	Trachea.	Not stated.	Published.	Not Published.
	63	40	23	62	I	39	7	4	2	0	0	I	3	0	I	2	28	20	2	3	8	39	3	21	5	58

Sex not stated, 4.

Age not stated, 9.

Not stated, 4

Not stated, 2.

Total No. Cases Not Published, 897 Total No. Cases Published, 103 Grand Total, 1,000

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